Enabling compliance with EU Regulation on the Reduction of Methane Emissions

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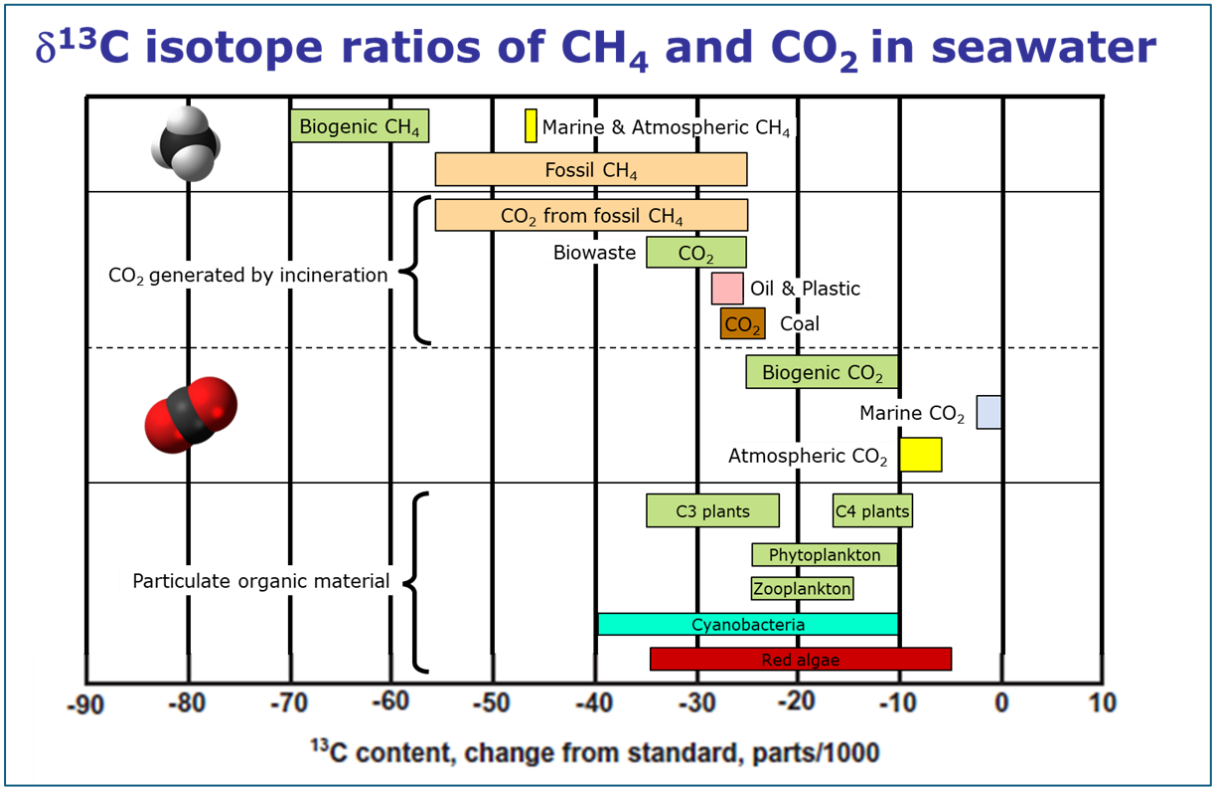
The North Sea region is shifting from a fossil fuel-based energy system to a green energy system and in Denmark this transition is accelerated with the decision to end oil and gas production by 2050. With this transition comes a very large decommissioning task and one of the main risks associated with the oil and gas abandonment is future leaks of hydrocarbons to the marine environment through breached well barriers. To mitigate this risk, new legislation from EU (2024/1787) requires 5 years of monitoring for potential leaks after abandonment and if a leak is detected remediating actions have to be initiated. As the abandonment phase is new for the industry, the technologies available for reliable surveillance in accordance with the regulation are immature and need further development. At DTU Offshore sensors for continuous monitoring of methane levels in the water around the decommissioned oil and gas platforms are currently under development.

Having a methane monitoring system in place around abandoned wells will lead to situations where unexpected levels of methane are picked up in the vicinity of abandoned wells. However, the methane detected does not necessarily originate from leaking oil and gas wells as natural biological processes at the seabed are also producing methane. Having a reliable and well established pre-abandonment environmental baseline can be a way to understand the site-specific variations in the methane levels. However, this will likely not be sufficient to decide if costly well barrier remediating actions have to be initiated.

The CH4IsotopeMonitor project is developing and offshore testing an approach that, when a methane abnormality has been detected, applies isotopic analysis of methane to assess the likely origin. This analysis will be done on site in the water column and is supporting decision making regarding correct remediating actions.



The system concept leverages compact isotope-ratio instrumentation and is being supported by the Danish EUDP program.

We will present a stepwise monitoring framework consisting of: pre-abandonment baselining, development of continuous monitoring at abandoned sites, and targeted analyses to help differentiate methane origins prior to remediation.